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(54) **Cryogenic cooling system and method with cold storage device**

(57) A cooling system (40) for providing cryogenic cooling fluid to an apparatus (1) comprises a re-circulation device (2), a passive cold storage device (11) having a porous matrix of material which directly contacts the cryogenic cooling fluid as the cryogenic cooling fluid passes through the passive cold storage device, a first portion of a fluid communication feed line (20a) fluidly connecting the re-circulation device (2) to the passive

cold storage device (11), a second portion of a fluid communication feed line (20b) fluidly connecting the passive cold storage device (11) to the apparatus (1) for communicating cryogenic cooling fluid to the apparatus, and a fluid communication return line (20c) fluidly connecting the apparatus (1) to the re-circulation device (2). The passive cold storage device (11) may comprise a regenerative heat exchanger including a porous matrix of metal wire mesh, metal spheres or ceramic spheres.

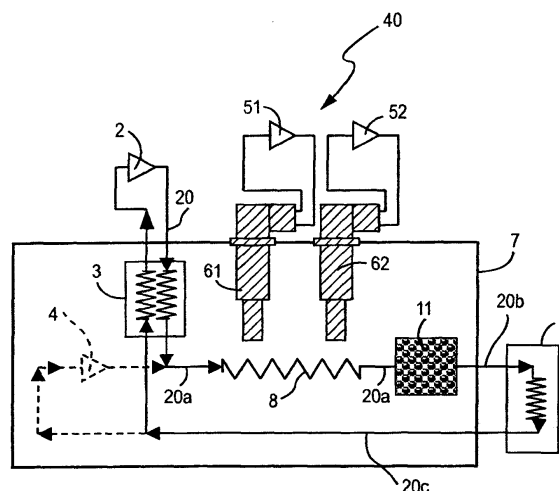


Fig. 1



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EUROPEAN SEARCH REPORT

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EP 04 25 4294

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 February 2005	Examiner Szilagyi, B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)



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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 February 2005	Examiner Szilagyi, B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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**LACK OF UNITY OF INVENTION
SHEET B**

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-7

Constructional details of a passive cold storage device

2. claims: 8-10

Cooling circuit having a second cold storage device

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-02-2005

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